Vol. 64, pp. 33-40 April 13, 1951

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

TWO NEW GENERA AND A NEW FAMILY OF TROPICAL AMERICAN FROGS

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A group of Central American frogs, at the present time placed in the genera *Centrolene* and *Centrolenella,* have for some time been of considerable interest to me, and I proposed this year to examine the material in the various American museums with a view of revising the group. At the present time specimens of these genera in certain museums are not available so I am delaying my attempt to review the entire group until such time as the material may become available. At this time I propose two new genera for species already established, and propose a family status for these small frogs.

The genus *Centrolene* was established in 1872 by Jimenez de la Espada for *C. geckoideum* from the Río Napa, Ecuador. This species is characterized chiefly by the presence of a process or hook growing out from the humerus in the males, and the presence of vomerine teeth. In females there may be some evidence of this humeral modification if the arm is somewhat dessicated, but I believe it is not otherwise visible externally. While the teeth are normally present they may be sometimes absent. The length of this species far exceeds any other belonging to this group of genera. While the length of the type is not given, a specimen examined has a length of 57mm.

A species of small frogs from near Limón on the Caribbean side of Costa Rica was described by Boettger as *Hyla prosoblepon.* This was later referred to the genus *Centrolene* by G. K. Noble.[1] It agreed in general with the characteristics of that genus. A distinct humeral hook was present in males of the genus (absent in females) and vomerine teeth were likewise present.[2] It differed very greatly in size and general appearance. Since the skeletal structure of *C. geckoideum* has not been studied it is not impossible that when the anatomy of these forms is better known they may be separated generically by other characters.

Certain other species may also belong with *Centrolene prosoblepon.* Noble (*loc. cit.*) has suggested that *Hyla ocellifera* Boulenger[3] from northwest Ecuador is a member of the group but did not specifically place

[1]Amer. Mus. Nat. Hist. Bull., vol. 42, 1920, p. 442; and Proc. Biol. Soc. Washington, vol. 37, 1924, pp. 66-67.

[2]The teeth are absent in a specimen taken with several others on the eastern slope of Volcán Poás, Costa Rica. In 22 specimens I have examined from an elevation of from 4000 to 5500 ft. elevation in Costa Rica, the teeth were present in all but one. Noble has mentioned that the teeth on the vomers may be absent, but this may be regarded as an infrequent exception. Similar loss of teeth is known to occur in certain species of *Hyla* and *Syrrhophus* in Mexico. In very young specimens of many frogs the teeth may be absent because they have not yet erupted.

[3]Ann. Mag. Nat. Hist., ser. 7, vol. 3, Apr. 1899, p. 277, pl. 12, fig. 4.

it in a genus. In this species the vomerine teeth are present but no mention is made of the humeral characteristics. I suspect that the type is a female (no mention being made of the vocal sac or vocal slits) in which case the hook would normally be absent. Proper placing of this form awaits further data on males.

Noble (*loc. cit.*) proposed the genus *Centrolenella* for a species of this group which he described under the name of *Centrolenella antioquiensis*, from a locality 14 mi. N. of Mesopotamia, Dept. Antioquia, Columbia. He had available one adult female, and two males of which one was adult. He states, "closely related to *Centrolene* from which it differs in the absence of vomerine teeth and humeral spines." Most of the other generic characteristics mentioned are likewise characteristic of *Centrolene.*

An examination by me in 1949 of the type and paratype specimens of *C. antioquiensis* seems to throw a different light on the matter. The adult paratype (so labeled) has well-developed humeral hooks and is presumed to be the adult specimen mentioned by Noble along with the type description. While the absence of this character is mentioned in the generic diagnosis, no further comment is made regarding the presence or absence of the hook, in the specific description. There was no evidence that any substitution of specimens had taken place. I returned to the American Museum in the summer of 1950 to continue my study of the group but the paratypes of the species could not be located at the time of my visit.

Inasmuch as the most salient generic character given for the genus *Centrolenella* as separating it from *Centrolene* is actually present in the male of the type species (the presence of the humeral hook in the males), and the remaining character of the vomerine teeth is somewhat variable, I shall regard *Centrolenella* a synonym of *Centrolene.*

This action leaves the numerous species that have been described under the genus, or later referred to it, without a generic name. Honoring Dr. Doris Cochran of the United States National Museum, I propose for these the name,

Cochranella gen. nov.

Genotype. *Centrolenella granulosa* Taylor.

This genus is characterized by the absence of the humeral hook or process in both sexes, absence (generally) of the vomerine teeth, without a free tip or sharp protruding spine on the pollical rudiment; toes webbed, with usually some webbing on the hand; terminal digital discs either transversely oval or subtriangular; a rather large palmar tubercle; no omosternum; a small cartilaginous sternum; pupil horizontal; ostia pharyngia present; the tympanum exposed or absent; a broad thin anal flap; pigment appearing in recently preserved animals, lavender to purple and confined to head and dorsal surfaces; vocal slits in males; astragalus and calcaneum fused into a single element.

Forms belonging or presumably belonging to this genus are:

Cochranello eurygnatha (Lutz)
Cochranella fleischmanni (Boettger)
Cochranella colymbiphyllum (Taylor)
Cochranella granulosa (Taylor)

Cochranella pulverata (Peters)
Cochranella uranoscopa (Müller)
Cochranella viridissima (Taylor)
Cochranella valerioi (Dunn)
Cochranella albomaculata (Taylor)
? *Cochranella buckleyi* (Boulenger)
? *Cochranella parambae* (Boulenger)
Cochranella chrysops (Cope)
Cochranella parvula (Boulenger)

A species of small frog related to the preceding genera differs markedly in having a large pollical remnant with a free tip, and bearing a sharp protruding spine in the male. It appears to stand in relation to *Cochranella*, as *Plectrohyla* does to *Hyla*. I propose for it the generic name

Teratohyla gen. nov.

Genotype: *Centrolenella spinosa* Taylor.

Characterized by the presence of a considerable pollical remnant with a free tip, and bearing a protruding spine in the adult males (present in females but less developed, the spine being entirely concealed). Vomerine teeth absent. Other characters as in *Cochranella*.

The species, *Teratohyla spinosa* occurs in the lowlands of Costa Rica and Panamá Canal Zone. In the latter locality it has been mistaken for another species. The status of *Hylella parambae* Boulenger (*parabambae*) is in question. It is not impossible that it may prove to represent a second species of this genus.

The group of frogs considered under the preceding genera has long been puzzling to herpetologists. Noble in his discussion (*loc. cit.*) has pointed out the isolated position that it holds. He thought that certain of the characters pointed to the family Leptodactylidae (which he later united with the Bufonidae) and certain of the characters pointed to the Hylidae. However he maintained them with the former group. Boulenger has associated species that he knew, with the Hylidae. Nieden in his Das Tierreich, Anura I, has regarded them as hylids. Smith and Taylor in their Mexican Catalogue placed them in the Hylidae without adequate investigation.

What I now regard as one of the most significant characters in this group of frogs, (and for that matter in the whole order), is one that previous workers have seemingly overlooked. This is the complete fusion of the bones in the third (tarsal) joint of the limb. This fusion is such that there is little superficial evidence that two bones are involved.

In 1941 I revived Cope's family name, Pelodytidae, for the living frogs known to have a fusion of the tarsal elements, having an arciferal pectoral girdle, procoelous vertebrae, a bony style in the sternum, the coccyx articulating by a double condyle, lacking the terminal processes on the ultimate phalanges of the digits, and the intercalated cartilages. Since the frogs here under consideration differ in all these characters from the Pelodytidae save in the condition of the astragalus and calcaneum, coccyx and vertebrae, I am proposing to give the group a family status, the name for which will then be

Centrolenidae, family novum.

The characteristics are: arciferal pectoral girdle; omosternum absent; sternum small cartilaginous; nine procoelous vertebrae; sacral diapophyses distinctly dilated; most terminal phalanges T-shaped; all digits with an intercalated cartilage between penultimate and ultimate phalanges; femur with a thin ridge near the acetabular articulation; coccyx articulating by a double condyle; digital formula of hand, 1,2,2,3,3; of foot 2,2,2,4,3.

These small frogs are secretive and are difficult to capture unless one finds them breeding. In consequence except for a very few species they are rare in collections. Since the territory comprising Costa Rica and Panamá has some ten described species representing three genera, one may anticipate that when the fauna of South America becomes well explored a large series of species with perhaps still other genera will be made known. I am aware of at least a dozen undescribed forms already in American museums masquerading under incorrect names.

Furthermore I regard it as strongly probable that certain African frogs, especially those now recognized in the subfamily Heleophryninae belong in the family Centrolenidae. Workers having available material of this group would do well to examine the condition of the limbs and to compare other structures with this family.

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